

REMARKS

Claims 1-17, 21, and 24-27 were previously pending, of which claims 3, 8, 17, and 26-27 have been canceled and claims 1, 4-6, 12, 14-15, 21, and 25 have been amended.

Reconsideration of presently pending claims 1-2, 4-7, 9-16, 21, and 24-25 is respectfully requested in light of the above amendments and the following remarks.

Rejections Under 35 U.S.C. §103

Claims 1-4 and 6-11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lee, et al. (US Patent No. 6,472,306 hereinafter referred to as “Lee 306”) in view of Lee, et al. (US Patent No. 6,649,512 hereinafter referred to as “Lee 512”) and in further view of Yamaguchi (JP 59182284 hereinafter referred to as “Yamaguchi”). Claim 2 is rejected under U.S.C. 103(a) as being unpatentable over Lee 306, Lee 512, Yamaguchi and further in view of Yu et al (US 6,764,952 hereinafter referred to as “Yu”). Claims 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee 306 in view of Lee 512. Claims 21 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee 306 in view of Lee 512. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee 306 in view of Lee 512 and further in view of Yamaguchi. Applicants traverse this rejection on the grounds that these references are defective in establishing a *prima facie* case of obviousness with respect to the claims.

In *KSR Int'l. Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739 (2007), the Court stated that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.” *Id.* at 1741 (emphasis added).

As the PTO recognizes in MPEP §2142:

... The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness...

In the present application, a *prima facie* case of obviousness does not exist for the claims as herein amended for the reasons set forth below.

The Examiner has not shown that all words in the claim have been considered

MPEP 2143.03 states that “[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art.” Quoting *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970). However, in the present matter, the Examiner has not shown that all words in the claim have been considered. For example, claim 1 recites, in part:

performing an inter-treatment on the glue layer, wherein the inter-treatment affects the upper and lower surfaces of the glue layer and improves an adhesive interface between the glue layer and the first layer and wherein the inter-treatment includes applying a plasma and an electron beam, and wherein a reacting gas of the plasma includes at least one of a hydrogen based gas and a helium based gas

Thus, the claim recites that an adhesive interface between the glue layer and a first layer is improved. The glue layer is formed directly on the first layer. The Examiner has not shown the relevant functionality in the cited art. The Examiner asserts that Lee 512 teaches the inter-treatment layer that “improves an adhesive interface between the glue layer and the first layer,” citing col. 3, lns. 28-40 of Lee 512. However, the relevant portion of Lee 512 is directed to “poor adhesion between the sealing layer and low k dielectric layer.” Lee 512 at col. 3, ln. 38. The low k dielectric layer lies above the glue layer. See Lee 512 at Fig. 2, dielectric layer 208. The Applicants find no indication of affecting the lower surface of the glue layer and improving an interface with an underlying layer.

To the extent that the Examiner is arguing that affecting the lower surface is inherent in the process of Lee 512, this is not properly supported. Lee 512 states “a plasma treatment is performed on the sealing layer by a reaction gas including at least one of CO₂, NH₃, NO₂, SiH₄, trimethylsilane (3MS), and tetramethylsilane (4MS) to create active sites on the surface of the sealing layer as indicated 206a.” Col. 3, lns. 8-12 (emphasis added). To show inherency, the Examiner must provide a rationale or evidence tending to show inherency. MPEP §2112(IV). “The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *Id.* The Examiner has not

made such as showing. Furthermore, the application at issue ([0031]) illustrates a treatment that reduces Si-CH₃ concentrations in glue layer. Thus, changes the material property and does not merely affect a single surface.

Thus, for this independent reason alone, the Examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

Independent Claim 12

Claim 12 recites, in part:

performing a plasma treatment to affect the upper and lower surfaces of the glue layer, wherein the plasma treatment includes a helium-based reactive gas, and wherein the affect to the upper and lower surfaces of the glue layer including improving adhesion;

forming a second metal layer directly on the upper surface of the glue layer, wherein the treatment process enhances an adhesiveness between the dielectric layer and the second metal layer.

Similar to as discussed above with reference to claim 1, the Examiner has not properly considered the claim element directed to "affecting the...lower surfaces of the glue layer." Furthermore, claim 12 as amended requires that the plasma treatment include a helium-based reactive gas. First, the Examiner has not properly considered this amended element. Second, as the cited portions of Lee 512 do not provide for a reactive gas of helium, any inherency argument based on the disclosure of 512 as related to affecting a lower layer necessarily fails. As the claimed process as Lee 512 are not the "same." See Office action at pg. 8. Thus, claim 12 is allowable for at least these reasons.

Independent Claim 21

Claim 21 recites in part " performing an inter-treatment on the glue layer to alter upper and lower surfaces of the glue layer for improved adhesiveness, wherein the performing the inter-treatment includes using a plasma, and wherein the plasma includes at least one of a helium-based reacting gas and a hydrogen-based reacting gas." For reasons discussed above with reference to claim 1, the rejection of claim 21 should be withdrawn.

Independent Claim 25

Claim 25 recites:

performing an inter-treatment on the glue layer to alter upper and lower surfaces of the glue layer for improved adhesiveness wherein the inter-treatment includes using at least one of a helium-based reacting gas plasma and an electron beam

The Examiner states that the inter-treatment process is provided by “Lee (512) teaches a plasma treatment process (fig. 2b) and applying the selected treatment process to affect the upper and lower surfaces of the silicon nitride layer.” Office action at pg. 12. First, as discussed above with reference to claim 1, Lee 512 does not teach affecting the lower surface of a silicon nitride layer. Secondly, the Examiner has not considered a helium-based reacting gas plasma. Thus, the rejection of claim 25 should be withdrawn for at least this reason.

Dependent Claims 1-2, 4-7, 9-16, 21, and 24

Dependent claims 2, 4-7, 9-11, 13-16, and 24 depend from and further limit independent claims 1, 12, and 21 and therefore are deemed to be patentable over the prior art.

Regarding claim 6, Applicants first note that it depends from and further limits allowable claim 1 and is therefore likewise allowable. Nonetheless, Applicants, additionally and independently, respond to Examiner’s citation of “the selected reacting gas is a helium-based gas (generally plasma treatment includes providing an inert gas such as helium in the processing chamber, therefore Lee teaches a helium-based gas.” Office action at pg. 5. First, the examiner provides no support for the statement that “generally plasma treatment includes ...helium,” and therefore has not provided a *prima facie* case of obviousness. Moreover, even assuming, arguendo, the Examiner’s statement to be true, providing an inert gas does not mean that Lee teaches providing a reacting gas including helium. Thus, the rejection of claim 6 should be withdrawn for at least these additional reasons.

CONCLUSION

An early formal notice of allowance of claims 1-2, 4-7, 9-16, 21, and 24-25 is requested. A personal or telephonic interview is respectfully requested to discuss any remaining issues in an effort to expedite the allowance of this application.

Respectfully submitted,



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